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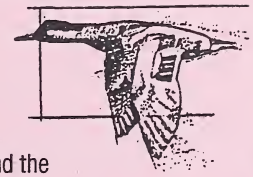
WARM SPRINGS PONDS FACT SHEET



U.S. Environmental Protection Agency, Montana Office and the Montana Department of Health & Environmental Sciences

June 1994

RECENT NEWS

The U.S. Environmental Protection Agency (EPA) recently approved ARCO's final design plans for cleanup at the Warm Springs Ponds inactive area. This area includes the oldest of the three ponds (Pond 1, which was constructed around 1910) and the area below the Pond 1 dike consisting of the meadows and the old Silver Bow Creek channel. Pond 1 is not involved in the active treatment of water from Silver Bow Creek, as are Ponds 2 and 3. (See Figure 1)

The final design plans enable ARCO to proceed immediately with Phase IV construction for the inactive area. Phase IV is the last phase of remedy construction for the inactive area, but it also marks the culmination of construction work for the entire pond system. Phase IV construction includes the following activities that are described in greater detail later in this fact sheet:

- Strengthen, extend and armor major portions of the Pond 1 berms
- Convert a portion of the existing lower bypass into a ground-water interception trench
- Install a system to pump intercepted ground water back to Pond 2 for treatment
- Construct wet closure cells in the eastern portion of Pond 1 and the area below Pond 1
- Complete flood control systems for runoff from the east hills
- Complete reconstruction of the bypass channel

BACKGROUND

Three separate cleanup actions have been completed or are underway at the Warm Springs Ponds. Construction activities began in 1990 at the Mill-Willow Bypass; moved to the active treatment ponds (Ponds 2 and 3) in 1992 and 1993; then to the inactive area (Pond 1 and the area below Pond 1) in late 1993. By the end of 1994 or early 1995, all major construction will be completed. Long-term water quality and biological monitoring will continue for as long as the ponds are needed to treat water entering the area from Silver Bow Creek.

Cleanup actions that have been completed for the Mill-Willow Bypass and the active area are summarized below.

Mill-Willow Bypass Removal Action

- Removed 440,000 cubic yards of contaminated tailings from the bypass channel and placed them in dry closures within Pond 3
- Enlarged the bypass channel to safely pass all floods
- Reconstructed the upper bypass channel by creating meanders, pools, riffles, and waterfowl ponds
- Costs: 4 million.

This Fact Sheet Describes the Final Phases of Cleanup at Warm Springs Ponds

Active Area (Ponds 2 and 3)

- Strengthened and armored the berms of Ponds 2 and 3 for earthquake and flood protection
- Upgraded the inlet and outlet structures of Ponds 2 and 3
- Constructed two wet closure cells in Pond 2
- Constructed a gated spillway in Pond 3 that allows discharges directly into the upper bypass channel
- Constructed a fully automated lime treatment facility at the inlet of Pond 3
- Initiated surface and ground water monitoring
- Costs: 24 million.

INACTIVE AREA CLEANUP

Goals and Objectives

The EPA identified goals and objectives for the inactive area cleanup which are documented in the 1992 Record of Decision. These goals and objectives are as follows:

- Prevent the release of pond bottom sediments during earthquakes and major floods
- Prevent ingestion of contaminated surface water
- Substantially reduce the potential for direct contact by both humans and wildlife
- Prevent off-site migration of contaminated ground water
- Continue long-term water quality and ecological monitoring

Phase I, II and III Activities

Construction of the inactive area remedy was divided into four phases. Activities under Phase I through Phase III have been completed and are briefly described below. All remaining construction will be conducted as a part of Phase IV.

Phase I

- Installed a trench in the western portion of Pond 1 to collect seepage from Pond 2
- Installed a collection and manifold system along the Pond 2 berm to prevent toe drains from discharging directly into the bypass channel

- Constructed temporary sedimentation control facilities within the bypass channel to protect downstream surface water quality during construction
- Removed tailings from the lower bypass channel adjacent to Pond 1 and placed them in a dry closure area in Pond 1

Phase II

- Constructed a meandering replacement channel for the lower bypass

Phase III

- Regraded the tailings in the western portion of Pond 1 to prepare for capping
- Moved borrow material from the east hills and portions of the lower bypass into the western portion of Pond 1
- Provided an 18 inch cover over the exposed tailings after 2 inches of limerock was layed down
- Reseeded the dry closed area with native vegetation
- Costs for Phase I-III: 4 million.

Phase IV Activities

The remainder of construction needed to accomplish the goals of the cleanup will be conducted under Phase IV. This last phase will begin in June 1994, and is anticipated to be complete by the end of 1994 or early 1995.

Construction remaining under Phase IV consists of the following activities:

1. Modify and enlarge the remaining portions of the Mill-Willow Bypass channel to safely route flood flows up to 70,000 cubic feet per second (cfs). This will allow safe passage of all floods from Silver Bow, Willow and Mill creeks.

2. Extend, strengthen and armor the north-south aspect of the Pond 1 berm. In accordance with specified state safety standards for high hazard dams, the reconstructed berm must withstand catastrophic earthquakes and floods.

3. Stabilize the east-west aspect of the Pond 1 berm. The reconstructed berm must withstand a catastrophic earthquake, thus providing protection against the movement of contaminated pond bottom sediments or tailings into the uncontaminated or wet closed areas below Pond 1.

4. Convert a portion of the abandoned bypass channel into a ground-water interception trench. (A new meandering bypass channel was created to replace this portion as Phase II construction). The interception trench will be deepened and pumps will be installed to create a pump-back system. Intercepted water that fails to meet specified standards will be pumped back to Pond 2 for treatment. The pump-back system is meant to be a temporary system to contain contaminated ground water for a limited time until chemical fixation corrects the ground-water contamination through source control. The pump-back system may eventually be shut off if appropriate performance standards are met. Monitoring wells and surface water quality monitoring stations will be placed at strategic locations.

5. Construct wet closure berms to enable flooding of the submerged tailings and contaminated soils. Within the eastern portion of Pond 1 and along the old Silver Bow Creek channel below Pond 1, these smaller berms will create a series of cells, which when flooded, will vary in depth from a minimum of one foot to a maximum of six feet. Flood the wet closure areas with treated water from Pond 2 and maintain proper water surface elevations in the wet closure cells. Prior to flooding, the tailings will be treated with lime.

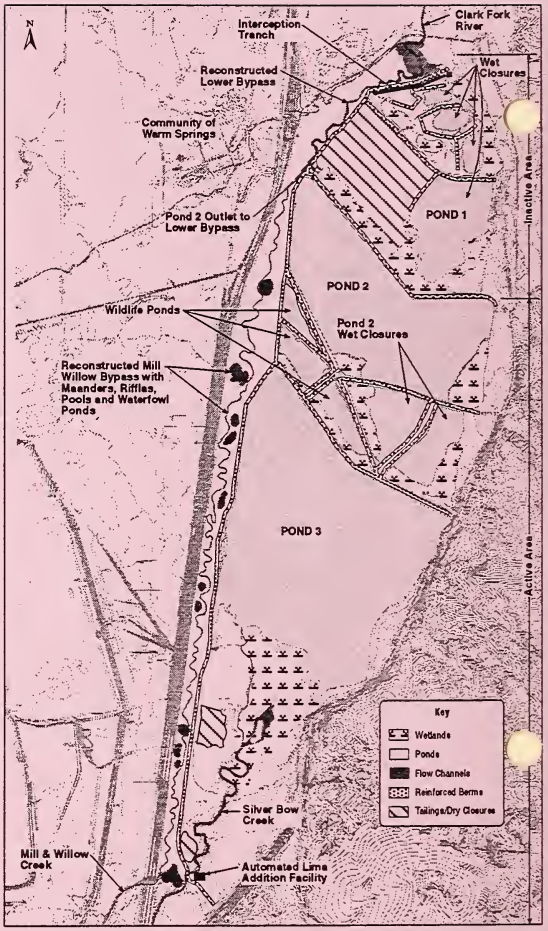


Figure 1
Warm Springs Ponds

6. Complete construction of the runoff collection and outflow system within Pond 1. This system will allow floods originating in the east hills to flow into Pond 1, but will not compromise the integrity of the wet and dry closures. It will be designed to accommodate catastrophic floods.

Estimated cost range: 13-17 million.

LONG TERM BIOLOGICAL MONITORING

Since the cleanup remedies for both the active and inactive areas will leave wastes in place, EPA has determined that long range monitoring of biological communities is appropriate and necessary. The monitoring effort will evaluate the effects of biological systems living in contact with metals in the water and sediment of the ponds and wetlands environments. The results will validate or invalidate the decision to chemically fix, wet close and contain in place the exposed and submerged tailings and contaminated soils.

What is "wet" and "dry" closure?

The process of wet closure is a combination of chemical immobilization of contaminants followed by flooding with water. The application of lime or lime slurry onto the tailings neutralizes acidic conditions and causes dissolved metals to precipitate and bind to soil particles. Flooding with higher pH water creates a reducing condition that prevents the metals from becoming mobile again (dissolving and moving with the flow of water).

Flooding with 1 to 6 feet of water also eliminates the potential for wind erosion and minimizes the chance for direct contact by humans and wildlife. The ponds that are formed by this process of wet closure create habitat for wildlife and fish. As algae, other plankton, and plants such as rushes and cattails mature in the ponds and complete their life cycles, they settle to the bottom. Over time, the dead plant material builds up over the flooded tailings and eventually isolates them well below the thickening pond bottom.

The process of dry closure involves covering, or capping the exposed tailings with a thin layer of lime or limestone, followed by a layer (12-18 inches) of uncontaminated soil. The entire area that is dry closed is contoured to control runoff and seeded with grasses to prevent erosion by wind or water. These reclaimed areas later provide excellent habitat for many kinds of wildlife and waterfowl.

The monitoring program will be conducted over a 7- to 10-year period, because the expected response of the biological communities to the remedial action will occur over many years. Sampling in most cases will be conducted once per year using established sampling procedures.

UNIQUE FEATURES OF THE WARM SPRINGS PONDS REMEDIES

EPA believes the cleanup remedies are protective of human health and the environment, and are expected to enhance fisheries and wildlife habitat in the area. In the inactive area alone, approximately 3.4 million cubic yards of tailings and associated contaminated soils will be treated and safely contained.

The cleanup of the bypass has eliminated metals releases that have resulted in fish kills in the past. Additionally, the original channel which was 4.8 miles long has been replaced with approximately 6 miles of meandering stream channel for fish and wildlife. The channel is being completely revegetated with naturally occurring plants, including grasses, willows, and shrubs. Numerous ponds were constructed along the way and will provide additional habitat for both fish and wildlife. The overall result of the reconstructed bypass channel is expected to support an increase in fish and aquatic populations, as well as terrestrial wildlife.

PUBLIC INVOLVEMENT

The EPA and State of Montana have conducted community involvement activities for the Warm Springs Ponds since 1986. Numerous informational meetings and public hearings have been held to encourage interaction with interested citizens and groups.

EPA endeavored for over a year to involve all affected parties before arriving at a recommended cleanup plan for the inactive area. Five public scoping meetings were held throughout the basin and numerous briefings and individual contacts were conducted between 1991 and 1993. In response to concerns expressed at these meetings, particularly by Deer Lodge and Missoula residents, EPA ordered or conducted supplemental feasibility studies. The proposed plan for the inactive area was issued in March 1992, and two final public hearings were held in Anaconda and Missoula before the close of the public comment period. A Record of Decision for the inactive area was issued in June 1992. Several briefings were conducted by EPA, State and ARCO officials prior to beginning the phased remedy construction.

A public briefing and open house was conducted jointly by EPA and ARCO on April 13, 1994. Interested individuals and groups were briefed with respect to upcoming construction activities and reviewed construction activities already completed. The entire Warm Springs Ponds area was toured at the end of the public briefing.

The public is welcome to view the documents leading to the decisions on cleanup at Warm Springs Ponds. Information repositories which contain key site studies and reports are listed on the last page of this fact sheet.

Photograph 1
Loading Tailings at the Relocated Bypass

Photograph 2
Reconstruction and Erosion Control of Bypass

Many of the previous listed documents can be found at these information repositories:

- Montana Tech Library/Butte
  West Park Street
- Butte EPA Office
  Court House
- Grant-Kohrs Ranch Office/Deer Lodge
  Main Street
- Mansfield Library/Missoula
  University of Montana Campus
- Montana State Library/Helena
  Capitol Complex
- USEPA Library/Helena
  301 South Park
- Hearst Free Library/Anaconda
  Fourth and Main

For further information regarding the Warm Springs Ponds, contact the following individuals:

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1-(406) 449-5720 x 246 or x 259

Jane Heath or Neil Marsh, MDHES
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Cogswell Building
P. O. Box 200901
Helena,MT 59620-0901
1-(800) 648-8465
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Mailing List

If you would like information on any Montana Superfund site, please mail this form to Pam Hillery, USEPA, Montana Office, 301 South Park, Drawer 10096, Helena, MT 59626.

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Site(s) interested in:

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Silver Bow Creek ____	Anaconda Smelter ____	Milltown ____
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